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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/722,813

11/26/2003

Jonathan C. Lucker

P17778

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06/05/2006

INTEL CORPORATION

P.O. BOX 5326

SANTA CLARA, CA 95056-5326

EXAMINER

BRADLEY, MATTHEW A

ART UNIT

PAPER NUMBER

2187

DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/722,813	Applicant(s) LUCKER ET AL.	
	Examiner Matthew Bradley	Art Unit 2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office Action has been issued in response to amendment filed 16 March 2006. Applicant's arguments have been fully considered and are persuasive. However, upon further consideration, a new ground(s) of rejection is made in view of Vihmalo et al (U.S. 2005/0055495). Accordingly, this action has NOT been made final.

Claim Status

Claims 1-28 remain pending and are ready for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims **4-5** and **11** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner notes that the instant claims recite 'writing to the first memory cell.' This is indefinite. The data is being read from a first memory cell and written to a second memory cell insofar as it appears to be clear in independent claims 1 and 10. Thus, the Examiner is unsure why there is writing to the first memory cell. For purposes of examination, the Examiner is interpreting the applicant's to have meant delaying writing to the second memory cell.

The 35 USC 112 2nd rejection to claim **5** set forth in the Office Action dated 16 December 2005 has been withdrawn in light of the instant amendment.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims **1, 9, 13-20, 26-28** rejected under 35 U.S.C. 102(e) as being anticipated by Vihmalo et al (U.S. 2005/0055495) hereinafter referred to as Vihmalo. The Examiner notes that the 35 U.S.C. 102(e) rejections are made in light of the 35 U.S.C. 112 2nd paragraph rejections as noted *supra*.

As per independent claim 1, Vihmalo teach,

- performing a read cycle that includes a destructive read operation and a write back operation; and wherein the destructive read operation includes reading information from a first memory cell of a memory and wherein the write back operation includes writing the information read from the first memory cell to a second memory cell of the memory (Paragraph 0012 and Claim 1). *The Examiner notes that the 'read cycle' as instantly claimed is taught by Vihmalo as a 'triggering signal which may correspond to a read operation (paragraph 0017 of Vihmalo and as shown in claim 11).'*

As per dependent claim 9, Vihmalo teach, wherein the first memory cell is located in a first segment of the memory and the second memory cell is located in a

second segment of the memory that is physically separated from the first segment (Paragraph 0012). *The Examiner notes that the system of Vihmalo maintains multi-block memory. Multi-block memory anticipates the instant limitation of memory array, as well as the individual blocks being physically separated from each individual block in that one block corresponds to a first block, and another block corresponds to a second block.*

As per independent claim **13**, Vihmalo teach, receiving a request to write information to a first location in a polymer memory; and writing the information to a second location in the polymer memory in response to the request (Paragraph 0012 and Claim 1). *The Examiner notes that the 'request to write information' as instantly claimed is taught by Vihmalo as a 'triggering signal which may correspond to a write operation (paragraph 0017 of Vihmalo and as shown in claim 12).'*

As per dependent claim **14**, Vihmalo teach, further comprising determining whether the second location is available and wherein the writing includes writing the information only to the second location in the polymer memory in response to the request (Paragraph 0021). *The Examiner notes that the system of Vihmalo writes information to the second location wherein the second memory cell, location, does not contain data that is being written to it (as taught in paragraph 0021).*

As per dependent claim **15**, Vihmalo teach, wherein writing includes writing the information to the second location and not writing the information to the first location in response to the request if the second location is available (Paragraph 0021). *The Examiner notes that the system of Vihmalo writes information to the second location*

wherein the second memory cell, location, does not contain data that is being written to it (as taught in paragraph 0021).

As per dependent claim **16**, Vihmalo teach, wherein the first location is in a first array of the polymer memory and the second location is in a second array of the polymer memory, wherein the first array is physically separated from the second array (Paragraph 0012). *The Examiner notes that the system of Vihmalo maintains multi-block memory. Multi-block memory anticipates the instant limitation of memory array, as well as the individual blocks being physically separated from each individual block in that one block corresponds to a first block, and another block corresponds to a second block.*

As per dependent claim **17**, Vihmalo teach, wherein the polymer memory is a destructive read ferroelectric memory, and the first location is in a first segment of the polymer memory and the second location is in a second segment of the polymer memory, wherein the first segment is physically separated from the second segment (Paragraph 0003 and Paragraph 0012). *The Examiner notes that the system of Vihmalo maintains multi-block memory. Multi-block memory anticipates the instant limitation of memory array, as well as the individual blocks being physically separated from each individual block in that one block corresponds to a first block, and another block corresponds to a second block.*

As per independent claim **18**, Vihmalo teach,

- a memory having at least two memory arrays; and (Paragraph 0012). *The Examiner notes that Vihmalo teach a first and second memory block, thus anticipating the limitation of 'at least two memory arrays.'*
- a memory controller coupled to the memory (Paragraph 0039)
- to perform a read cycle that includes a destructive read operation and a write back operation, wherein the destructive read operation includes reading information from a first memory cell of the memory and wherein the write back operation includes writing the information read from the first memory cell to a second memory cell of the memory (Paragraph 0012 and Claim 1). *The Examiner notes that the 'read cycle' as instantly claimed is taught by Vihmalo as a 'triggering signal which may correspond to a read operation (paragraph 0017 of Vihmalo and as shown in claim 11).'*

As per dependent claim **19**, Vihmalo teach, wherein the first and second memory cells are ferroelectric memory cells comprising a non-volatile ferroelectric polymer material (Paragraph 0003 and Paragraph 0039 as 'all memory types').

As per dependent claim **20**, Vihmalo teach, wherein the non-volatile ferroelectric polymer material comprises a polyvinyl fluoride, a polyethylene fluoride, a polyvinyl chloride, a polyethylene chloride, a polyacrylonitrile, a polyamide, copolymers thereof, or combinations thereof (Paragraph 0003 and 0005).

As per independent claim **26**, Vihmalo teach, receiving a request to write information to a first location in a ferroelectric memory; and writing the information to a second location in the ferroelectric memory in response to the request (Paragraph 0012

and Claim 1). *The Examiner notes that the 'request to write information' as instantly claimed is taught by Vihmalo as a 'triggering signal which may correspond to a write operation (paragraph 0017 of Vihmalo and as shown in claim 12).'*

As per dependent claim 27, Vihmalo teach, further comprising determining whether the second location is available and wherein the writing includes writing the information only to the second location in the ferroelectric memory in response to the request (Paragraph 0021). *The Examiner notes that the system of Vihmalo writes information to the second location wherein the second memory cell, location, does not contain data that is being written to it (as taught in paragraph 0021).*

As per dependent claim 28, Vihmalo teach, wherein writing includes writing the information to the second location and not writing the information to the first location in response to the request if the second location is available, wherein the first location is in a first array of the ferroelectric memory and the second location is in a second array of the ferroelectric memory, and wherein the first array is physically separated from the second array (Paragraphs 0012 and 0021). *The Examiner notes that the system of Vihmalo maintains multi-block memory. Multi-block memory anticipates the instant limitation of memory array, as well as the individual blocks being physically separated from each individual block in that one block corresponds to a first block, and another block corresponds to a second block.*

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2187

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vihmalo and in view of Kamp et al (U.S. 6,201,731), hereinafter referred to as Kamp, and Mihara et al (U.S. 5,406,510), hereinafter referred to as Mihara, which is incorporated by reference in Kamp (see Column 17 lines 3-5).

As per dependent claim 2, Vihmalo teach the limitation as noted supra.

Vihmalo does not teach explicitly teach determining the amount of charge released from the first memory cell to determine the logic state of the information stored in the first memory cell.

Kamp teach, wherein reading information includes: applying a read voltage across the first memory cell; and determining the amount of charge released from the first memory cell to determine the logic state of the information stored in the first memory cell. (Column 6 line 65 to Column 7 line 37 of Mihara which is incorporated by reference in Kamp as though it was fully disclosed in Kamp).

Vihmalo and Kamp are analogous art because they are from the same field of endeavor, namely computing systems with destructive memories.

At the time of invention it would have been obvious to one of ordinary skill in the art, having both the teachings of Vihmalo and Kamp before him/her to combine the system of Kamp into Vihmalo to exploit the benefit of Kamp's system which prevents data from being disturbed in the event of unstable power conditions.

The motivation for doing so would have been that, “the present invention solves the above problem by providing a disturb prevention circuit and method that prevents unstable power conditions from disturbing data in the memory cells of a memory system (Column 2 lines 23-26 of Kamp).”

Therefore it would have been obvious to combine Vihmalo with Kamp for the benefit of prevention of data being disturbed during unstable power conditions to obtain the invention as specified in claims 2-9.

As per dependent claim 3, Mihara teach, wherein writing the information includes applying a write voltage across the second memory cell (Column 8 lines 18-25).

As per dependent claim 4, Kamp teach, delaying writing to the first memory cell for a predetermined amount of time (Column 17 lines 22-26).

As per dependent claim 5, Mihara teach, wherein the writing to the first memory cell includes applying a first voltage having a first polarity across the first memory cell, wherein the first voltage is sufficient to switch the polarization of the first memory cell (Column 7 line 44-51). *The Examiner notes that the charge that is applied to the capacitor is enough to erase the logic 1 that the capacitor is holding. Thus this destroying of the logic 1 anticipates the instant limitation of switching the polarity.*

As per dependent claim 6, Kamp teach, wherein the destructive read operation includes reading information from a first memory cell of a non-volatile polymer ferroelectric disk cache memory (Column 1 lines 27-30).

As per dependent claim 7, Kamp teach, wherein writing the information includes writing the information read from the first memory cell to a second memory cell if the

second memory cell is blank (Column 17 lines 15-19). *The Examiner notes that the system of Kamp teaches that operations take place before the cell or cells have been rewritten. Accordingly, the system of Kamp teaches the limitation of if the second memory cell is blank by performing the operations on cells that have not been rewritten.*

As per dependent claim 8, Kamp teach, wherein the write back operation further includes writing the information read from the first memory cell back to the first memory cell after a predetermined amount of time has passed (Column 17 lines 22-26).

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vihmalo and Kamp and in view of Rubinstein (U.S. 5,913,215) hereinafter referred to as Rubinstein.

Claims 10, 11, and 12 are method versions of claims 1, 4, and 7, respectively, enabled by instructions.

Vihmalo and Kamp, however, do not expressly disclose that the method is performed by a software series of instructions, instead disclosing a set of hardware components.

Rubinstein discloses, on Col. 10, lines 3-15, that computer methods may be performed either by a series of instructions, or by specific hardware components that contain hard-wired logic for performing the method, or by any combination of the two.

Vihmalo and Kamp, and Rubinstein are analogous art because they are from the same general field of endeavor, namely computer-controlled methods.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the method of Vihmalo and Kamp, by embodying it in

executable instructions.

The motivation for doing so is portability and ease of installation. For example, it is well known that a method encoded in a program may be installed onto different systems much more quickly and easily than can hardware components designed to perform the same method.

Therefore, it would have been obvious to combine Vihmalo and Kamp, with Rubinstein for the benefits shown above, to obtain the invention as specified in claims 10-12.

Claims **21-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Vihmalo (U.S. 6,201,731).

As per independent claim **21**, Vihmalo teach, a disk memory; a disk cache memory coupled to the disk memory; and a memory controller coupled to the memory to perform a read cycle that includes a destructive read operation and a write back operation, wherein the destructive read operation includes reading information from a first memory cell of the memory and wherein the write back operation includes writing the information read from the first memory cell to a second memory cell of the memory (Paragraph 0012 and Claim 1). *The Examiner notes that the 'read cycle' as instantly claimed is taught by Vihmalo as a 'triggering signal which may correspond to a read operation (paragraph 0017 of Vihmalo and as shown in claim 11).'* Further the Examiner would like to draw applicant's attention to Paragraph 0003 and Paragraph 0005 of Vihmalo where 'all memory type's are disclosed. Thus it would have been

obvious to one of ordinary skill in the art to implement the system of Vihmalo in a disk system to realize the invention as specified in claims 21-25.

As per dependent claim **22**, Vihmalo teach, wherein the storage capacity of the disk cache memory is at least 500 megabytes and the storage capacity of the disk memory is at least one gigabyte (Paragraph 0003 and 0005). *The Examiner notes that the difference between Vihmalo and the claim is the claim recite specific storage capacities. However, the specific use of a certain capacity, does not have a disclosed purpose nor are disclosed to overcome any deficiencies in the prior art. As such, the capacity may have been embodied in a number of manners, such as one to many megabytes or one to many gigabytes. Accordingly, it would have been an obvious matter to one skilled in the art to utilize any capacity as necessitated by a user's need in the system of Kamp. See also MPEP 2144.04 as to why a mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled.*

As per dependent claim **23**, Vihmalo teach, wherein the disk cache memory is a non-volatile polymer memory (Paragraph 0003 and 0005).

As per dependent claim **24**, Vihmalo teach, wherein the disk cache memory is a non-volatile ferroelectric memory (Paragraph 0003 and 0005).

As per dependent claim **25**, Vihmalo teach, wherein the first memory cell is located in a first array of the memory and the second memory cell is located in a second array of the memory that is physically separated from the first array (Paragraph 0012). *The Examiner notes that the system of Vihmalo maintains multi-block memory. Multi-*

block memory anticipates the instant limitation of memory array, as well as the individual blocks being physically separated from each individual block in that one block corresponds to a first block, and another block corresponds to a second block.

Response to Arguments

Applicant's arguments, filed 16 March 2006, have been fully considered and are persuasive. However, upon further consideration, a new ground(s) of rejection is made in view of Vihmalo et al (U.S. 2005/0055495). Accordingly, this action has NOT been made final.

Any argument not specifically addressed is considered moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

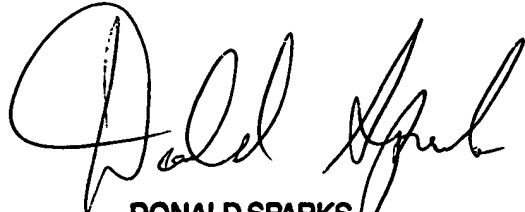
1. U.S. 2004/0177212 Chang et al teach a method for maintaining an average erase count in a non-volatile storage system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached on 6:30-3:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DAS/mb



DONALD SPARKS
SUPERVISORY PATENT EXAMINER